THE EFFECT OF PROLACTIN ON FETAL MEMBRANE TRANSPORT

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The amniotic fluid is rich in prolactin (Prl) which most probably originates from the decidua (1). Lactogen receptors have been demonstrated in the chorion laeve (2), but the functional significance of amniotic Prl is not settled (3, 4, 5).

The tracer permeability of the unseparated chorio-amnion has been investigated in our laboratory using a perfusion chamber technique with human plasma as perfusates. In conformity with earlier studies (for survey see: 6) the membrane was found to be impermeable to albumin, but readily permeable to tritiated water (THO), urea, and antipyrine. The diffusion of sucrose, however, was found to be significantly restricted as compared to that of THO. Removal of calcium and magnesium by EDTA did not induce any alterations of the permeability pattern. These results suggest that the diffusional transport of water and hydrophilic molecules predominantly occurs transcellularly in the chorio-amnion, and that these cellular "pores" have a functional radius of 50-100 Å.

Addition of 100-200 ng/ml of ovine Prl to one or both perfusates was followed by characteristical changes in the diffusivity of the membrane. Typically, the THO-permeability decreased, whereas the sucrose-permeability increased. The mean value of the permeability ratios (PI_{Suc}/PI_{THO}) obtained during the Prl exposure in 15 different membranes was 0.223, which is very close to the ratio between their free diffusional coefficients in water (D_{Suc}/D_{THO} = 0.210). This indicated that sucrose was no longer restricted, and accordingly that its osmotic activity was abolished. The Prl responses could be elicited by addition of the hormone to the amniotic side or to the chorionic side of the membrane, and they could be reversed by reperfusions with normal plasma (Fig.1).

The present results focus the interest on Prl as regulator of the water shift across the chorio-amnion and thereby as regulator of the volume and composition of the amniotic fluid.

0300-5577/82/0102-0049 $ 2.00
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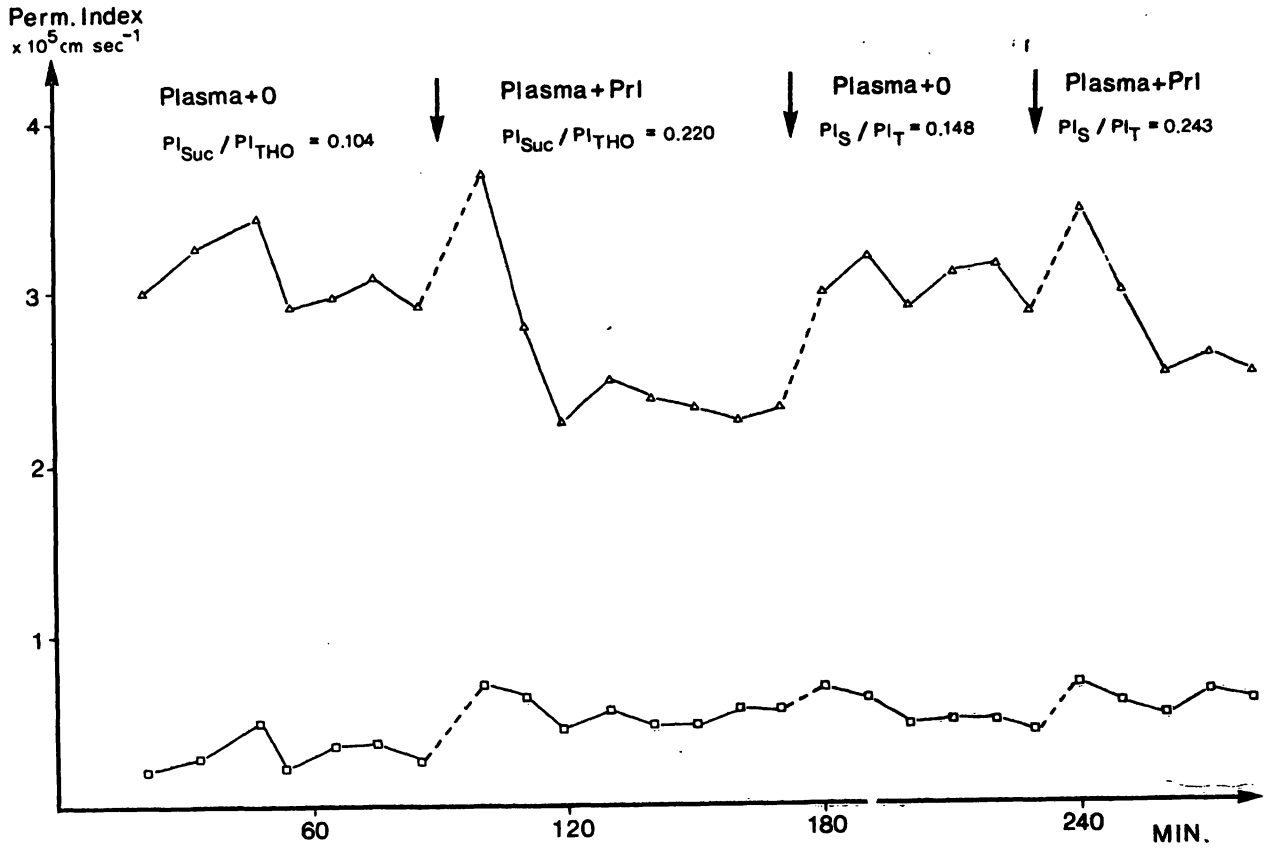

Fig. 1. Permeability indices of THO (Δ) and sucrose (□) obtained during perfusions with normal plasma and with plasma containing 200 ng/ml of o-Prl

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